



City of Harrisonburg, Virginia

1998 Annual Water Quality Report

QUALITY ON TAP !

The City of Harrisonburg is proud to announce that our public water supply system is in compliance with all state and federal waterworks regulations. There have been no violations of a contaminant level or of any other water quality standard.

The most important goal of the employees of the Harrisonburg Water Department is to consistently provide customers with the best quality water possible. The water is monitored and tested 24 hours a day in order to provide you a safe and dependable supply of drinking water.

We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of our water.

Customers are more aware of their environment and are concerned with how water affects their bodies and the overall health of their families. In response to the increased customer concern, we have developed this brochure to answer some questions about the quality of our water.

Where does my water come from ?

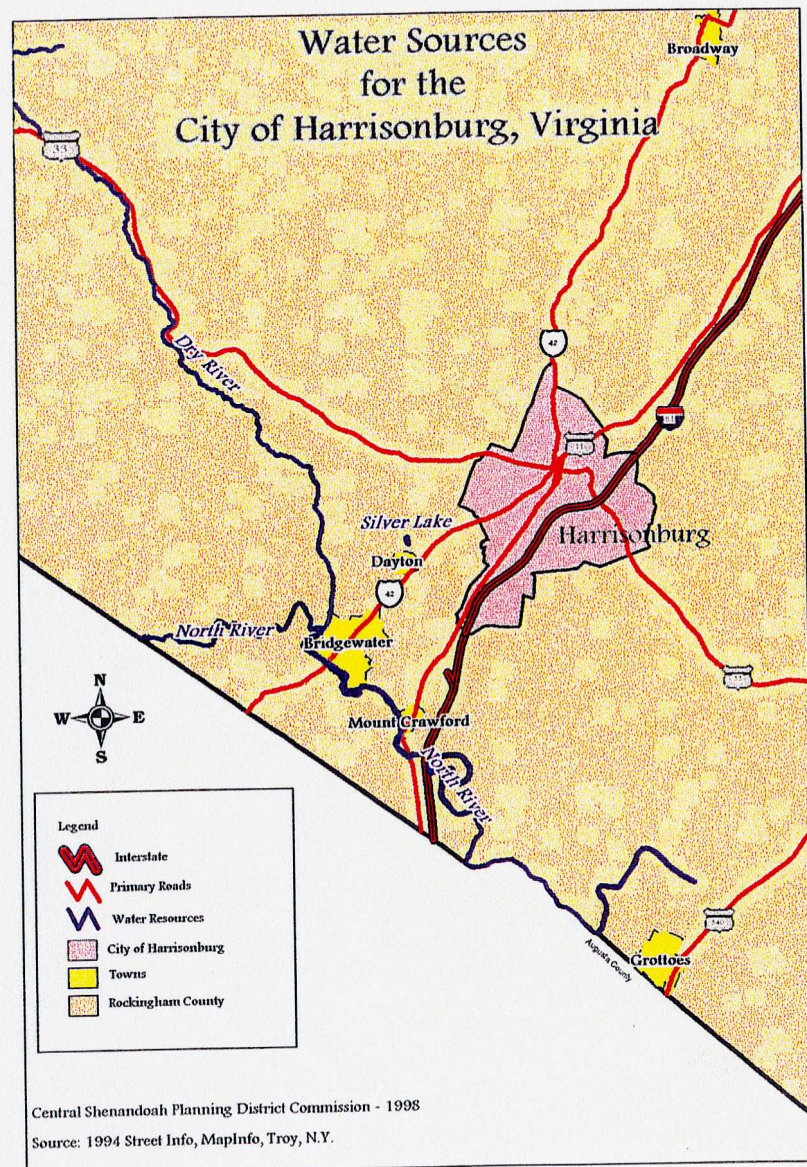
- * North River in Bridgewater, VA
- * Dry River in Rawley Springs, VA
- * Silver Lake in Dayton, VA

The North River and Dry River are surface water sources and Silver Lake is a ground water source under the influence of surface water.

Contact our Director of Public Utilities, Mr. Mike Collins at (540) 434-9959 if you have any questions about this report or have water quality concerns.

You may see updates of this report on our web site

<http://www.ci.harrisonburg.va.us/>



The Harrisonburg Water Treatment Plant routinely monitors for constituents in your drinking water according to Federal and State laws. This table shows the results of our monitoring for the period of January 1st to December 31st, 1998. All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some constituents. It's important to remember that the presence of these constituents does not necessarily pose a health risk.

In this table you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms we've provided the following definitions:

Non-Detects (ND) - laboratory analysis indicates that the constituent is not present.

Parts per million (ppm) or Milligrams per liter (mg/l) - one part per million corresponds to one minute in two years or a single penny in \$10,000.

Parts per billion (ppb) or Micrograms per liter - one part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.

Parts per trillion (ppt) or Nanograms per liter (nanograms/l) - one part per trillion corresponds to one minute in 2,000,000 years, or a single penny in \$10,000,000,000.

Parts per quadrillion (ppq) or Picograms per liter (picograms/l) - one part per quadrillion corresponds to one minute in 2,000,000,000 years or one penny in \$10,000,000,000,000.

Picocuries per liter (pCi/L) - picocuries per liter is a measure of the radioactivity in water.

Millirems per year (mrem/yr) - measure of radiation absorbed by the body.

Million Fibers per Liter (MFL) - million fibers per liter is a measure of the presence of asbestos fibers that are longer than 10 micrometers.

Nephelometric Turbidity Unit (NTU) - nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Action Level - the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Treatment Technique (TT) - (mandatory language) A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.

Maximum Contaminant Level - (mandatory language) The "Maximum Allowed" (MCL) is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal - (mandatory language) The "Goal"(MCLG) is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

N/A - Not Available

TEST RESULTS

Contaminant	Violation Y/N	Level Detected	Unit Measurement	MCLG	MCL	Likely Source of Contamination
Microbiological Contaminants						
1. Turbidity	N	0.17	NTU	n/a	TT	Soil runoff
Radioactive Contaminants						
2. Beta/photon emitters	N	1.6	mrem/yr	0	4	Decay of natural and man-made deposits
3. Alpha emitters	N	.5	pCi/l	0	15	Erosion of natural deposits
Inorganic Contaminants						
4. Antimony	N	< 2.0	ppb	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
5. Arsenic	N	< 2.0	ppb	n/a	50	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
6. Barium	N	< 0.2	ppm	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
7. Beryllium	N	< 2.0	ppb	4	4	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
8. Cadmium	N	< 2.0	ppb	5	5	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
9. Chromium	N	< 0.01	ppb	100	100	Discharge from steel and pulp mills; erosion of natural deposits
10. Copper	N	< 0.2	ppm	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
11. Cyanide	N	< 0.01	ppb	200	200	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
12. Fluoride	N	1.05	ppm	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
13. Lead	N	< 2.0	ppb	0	AL=15	Corrosion of household plumbing systems, erosion of natural deposits
14. Mercury (inorganic)	N	< 0.2	ppb	2	2	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland
15. Selenium	N	< .01	ppb	50	50	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines
16. Thallium	N	< .002	ppb	0.5	2	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories

Synthetic Organic Contaminants including Pesticides and Herbicides -1997 Data

17. 2,4-D	N	< 0.1	ppb	70	70	Runoff from herbicide used on row crops
18. 2,4,5-TP (Silvex)	N	< 0.2	ppb	50	50	Residue of banned herbicide
19. Alachlor	N	< 0.2	ppb	0	2	Runoff from herbicide used on row crops
20. Atrazine	N	< .01	ppb	3	3	Runoff from herbicide used on row crops
21. Carbofuran	N	< 0.9	ppb	40	40	Leaching of soil fumigant used on rice and alfalfa
22. Chlordane	N	< 0.2	ppb	0	2	Residue of banned termiticide
23. Dalapon	N	< 1.0	ppb	200	200	Runoff from herbicide used on rights of way
24. Dibromochloropropane	N	< 20.0	nanograms/l	0	200	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards
25. Dinoseb	N	< 0.2	ppb	7	7	Runoff from herbicide used on soybeans and vegetables
26. Endrin	N	< 0.01	ppb	2	2	Residue of banned insecticide
27. Ethylene dibromide	N	< 10.0	nanograms/l	0	50	Discharge from petroleum refineries
28. Heptachlor	N	< 40.0	nanograms/l	0	400	Residue of banned termiticide
29. Heptachlor epoxide	N	< 20.0	nanograms/l	0	200	Breakdown of heptachlor
30. Hexachlorobenzene	N	< 0.1	ppb	0	1	Discharge from metal refineries and agricultural chemical factories
31. Hexachlorocyclopentadiene	N	< 0.1	ppb	50	50	Discharge from chemical factories
32. Lindane	N	< 0.1	nanograms/l	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens
33. Methoxychlor	N	< 0.2	ppb	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
34. Oxamyl [Vydate]	N	< 2.0	ppb	200	200	Runoff/leaching from insecticide used on apples, potatoes and tomatoes
35. PCBs [Polychlorinated biphenyls]	N	<100.0	nanograms/l	0	500	Runoff from landfills; discharge of waste chemicals
36. Pentachlorophenol	N	< 0.04	ppb	0	1	Discharge from wood preserving factories
37. Picloram	N	< 0.1	ppb	500	500	Herbicide runoff
38. Simazine	N	< 0.07	ppb	4	4	Herbicide runoff
39. Toxaphene	N	< 0.5	ppb	0	3	Runoff/leaching from insecticide used on cotton and cattle

Volatile Organic Contaminants

40. Benzene	N	0.5	ppb	0	5	Discharge from factories; leaching from gas storage tanks and landfills
41. Carbon tetrachloride	N	0.5	ppb	0	5	Discharge from chemical plants and other industrial activities
42. Chlorobenzene	N	0.5	ppb	100	100	Discharge from chemical and agricultural chemical factories
43. o-Dichlorobenzene	N	0.5	ppb	600	600	Discharge from industrial chemical factories

44. p-Dichlorobenzene	N	0.5	ppb	75	75	Discharge from industrial chemical factories
45. 1,2 - Dichloroethane	N	0.5	ppb	0	5	Discharge from industrial chemical factories
46. 1,1 - Dichloroethylene	N	0.5	ppb	7	7	Discharge from industrial chemical factories
47. cis-1,2-dichloroethylene	N	0.5	ppb	70	70	Discharge from industrial chemical factories
48. trans - 1,2 - Dichloroethylene	N	0.5	ppb	100	100	Discharge from industrial chemical factories
49. Dichloromethane	N	0.5	ppb	0	5	Discharge from pharmaceutical and chemical factories
50. 1,2-Dichloropropane	N	0.5	ppb	0	5	Discharge from industrial chemical factories
51. Ethylbenzene	N	0.5	ppb	700	700	Discharge from petroleum refineries
52. Styrene	N	0.5	ppb	100	100	Discharge from rubber and plastic factories; leaching from landfills
53. Perchloroethene	N	0.5	ppb	0	5	Leaching from PVC pipes; discharge from factories and dry cleaners
54. 1,2,4 - Trichlorobenzene	N	0.5	ppb	9	9	Discharge from textile-finishing factories
55. 1,1,1 - Trichloroethane	N	0.5	ppb	200	200	Discharge from metal degreasing sites and other factories
56. 1,1,2 -Trichloroethane	N	0.5	ppb	3	5	Discharge from industrial chemical factories
57. Trichloroethylene	N	0.5	ppb	0	5	Discharge from metal degreasing sites and other factories
58. Toluene	N	0.5	ppb	1	1	Discharge from petroleum factories
59. Vinyl Chloride	N	0.5	ppb	0	2	Leaching from PVC piping; discharge from plastics factories
60. Xylenes	N	0.5	ppb	10	10	Discharge from petroleum factories; discharge from chemical factories

Microbiological Contaminants:

(1) Turbidity. Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Radioactive Contaminants:

(2) Beta/photon emitters. Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.

(3) Alpha emitters. Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.

Inorganic Contaminants:

(4) Antimony. Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.

(5) Arsenic. Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

(6) Barium. Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.

(7) Beryllium. Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.

- (8) Cadmium. Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
- (9) Chromium. Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
- (10) Copper. Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
- (11) Cyanide. Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
- (12) Fluoride. Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Children may get mottled teeth.
- (13) Lead. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
- (14) Mercury (inorganic). Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
- (15) Selenium. Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
- (16) Thallium. Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.

Synthetic organic contaminants including pesticides and herbicides:

- (17) 2,4-D. Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
- (18) 2,4,5-TP (Silvex). Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
- (19) Alachlor. Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.
- (20) Atrazine. Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
- (21) Carbofuran. Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
- (22) Chlordane. Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
- (23) Dalapon. Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
- (24) Dibromochloropropane (DBCP). Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
- (25) Dinoseb. Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
- (26) Endrin. Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
- (27) Ethylene dibromide. Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
- (28) Heptachlor. Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
- (29) Heptachlor epoxide. Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.
- (30) Hexachlorobenzene. Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
- (31) Hexachlorocyclopentadiene. Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
- (32) Lindane. Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
- (33) Methoxychlor. Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
- (34) Oxamyl [Vydate]. Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.

- (35) PCBs [Polychlorinated biphenyls]. Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
- (36) Pentachlorophenol. Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
- (37) Picloram. Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
- (38) Simazine. Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
- (39) Toxaphene. Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.

Volatile Organic Contaminants:

- (40) Benzene. Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
- (41) Carbon Tetrachloride. Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
- (42) Chlorobenzene. Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
- (43) o-Dichlorobenzene. Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
- (44) p-Dichlorobenzene. Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
- (45) 1,2-Dichloroethane. Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.
- (46) 1,1-Dichloroethylene. Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
- (47) cis-1,2-Dichloroethylene. Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
- (48) trans-1,2-Dichloroethylene. Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
- (49) Dichloromethane. Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
- (50) 1,2-Dichloropropane. Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
- (51) Ethylbenzene. Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
- (52) Styrene. Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
- (53) Tetrachloroethylene. Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
- (54) 1,2,4-Trichlorobenzene. Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
- (55) 1,1,1-Trichloroethane. Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
- (56) 1,1,2-Trichloroethane. Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
- (57) Trichloroethylene. Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
- (58) Toluene. Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
- (59) Vinyl Chloride. Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
- (60) Xylenes. Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

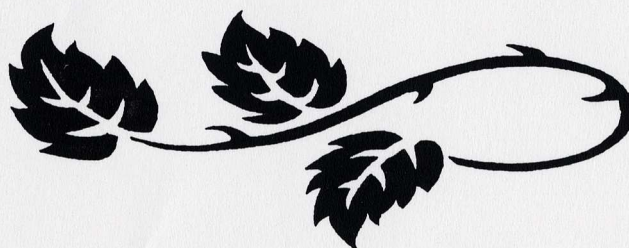
As you can see by the table, our system had no violations. We're proud that your drinking water meets or exceeds all Federal and State requirements. We have learned through our monitoring and testing that some constituents have been detected. The EPA has determined that **your water IS SAFE** at these levels.

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the **Environmental Protection Agency's Safe Drinking Water Hotline** at

1-800-426-4791.

MCL's are set at very stringent levels. To understand the possible health effects described for many regulated constituents, a person would have to drink 2 liters of water every day at the MCL level for a lifetime to have a one-in-a-million chance of having the described health effect.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).



SUPPLEMENTAL INFORMATION :

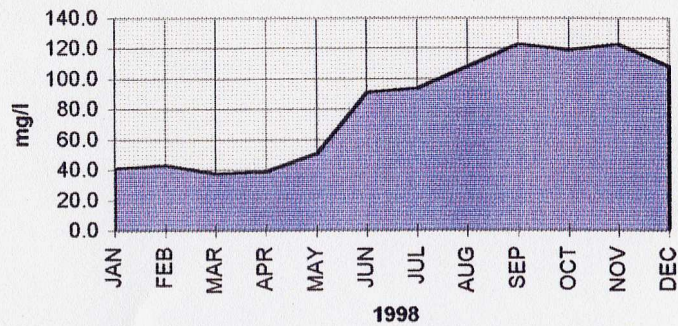
Whether you are just moving to our friendly city or are considering buying a water softening system or a water purifying system, some questions may come to mind concerning the basic integrity of your water. We wanted to provide you with some additional information regarding the hardness of your water, and the chlorine and flouride levels during the year 1998.

Hardness:

Excessive	> 180 mg/l
Hard	121 - 180 mg/l
Moderate	61 - 120 mg/l
Soft	0 - 60 mg/l

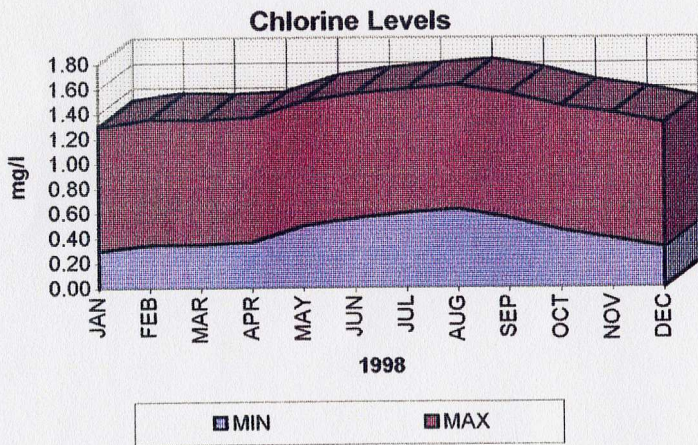
Most households are comfortable with the level of 61-120 mg/l. Looking at the averages, the highest degree of hardness in our water for the year 1998 was in November (123 mg/l) -very low in the hard degree range. The water should not contribute to skin dryness or force you to use an excessive amount of detergents or bleaches for a load of clothes.

Degree of Hardness



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Chlorine:



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Chlorine is added to the water as a public safety measure. It acts as a disinfectant by clearing the water of undesirable elements and has a positive effect on the overall taste.

The concentration does vary depending on your location within the water distribution system.

Max = Level at the Water Treatment Plant
Min = Lowest level detected in the distribution system
Tests are conducted at various locations in the city.

Level should be above .2 mg/l in distribution system.

Fluoride:

Water additive which promotes strong teeth

Fluoride Levels

